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KENYON & KENYON LLP 333 W. SAN CARLOS STREET SUITE 600 SAN JOSE, CA 95110-2731			EXAMINER TORRES, JUAN A	
			ART UNIT 2611	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/797,254

Applicant(s)

OBERG ET AL.

Examiner

Juan A. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-140 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 22-29, 45-52, 68-75, 91-98, 114-121 and 137-140 is/are rejected.
- 7) ☒ Claim(s) 7-21, 30-44, 53-67, 76-90, 99-113 and 122-136 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

The modifications to the drawings were received on 09/11/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/11/2007, the Examiner withdraws the drawings objections of the previous Office action.

### ***Specification***

The modifications to the specification were received on 09/11/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/11/2007, the Examiner withdraws the specification objections of the previous Office action.

### ***Claim Objections***

The Examiner doesn't agree with the interpretation of the word "if" in the claims, and strongly believe that it is improper the use of the word "if" in the claims, because the word "if" render the claim indefiniteness as indicated in the previous Office action.

The only exception to this rule is when all the possibilities are covert (i.e. when the word "if" is later follow by the word "else", or when the word "if" is used twice).

Taken into account that this is only an objection; that MPEP effectively doesn't, specifically indicates, that the word "if" can not be used under 35 USC § 112 second paragraph, and in an effort to advance the prosecution of the case, the Examiner withdraws the claim objections to claims 5-8, 28-31, 51-54, 74-77, 97-100 and 120-123 of the previous Office action.

The Examiner still advice to change "if" to "when" for the reasons indicated in the previous Office action.

***Claim Rejections - 35 USC § 101***

The modifications to the claims were received on 09/11/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/11/2007, the Examiner withdraws the claim rejections under 35 USC § 101 to claims 116-138 of the previous Office action.

***Response to Arguments***

Regarding claims 1, 47 and 93:

Applicant's arguments filed on 09/11/2007 have been fully considered but they are not persuasive.

The Applicant contends, "Providing a single early decision output to drive a decision-driven control loop, as in the prior art which Applicants discuss in the Background section, addresses the trade-off between accuracy and speed. The longer the memory path used to derive the detector output, the greater the latency. Reducing latency also reduces accuracy. Providing an early decision output with a short memory path reduces latency, but again, reduces accuracy. In the invention of independent claims 1, 47, and 93, a second early decision output is provided, as well as a first early decision output, and those two outputs are processed to drive a decision-driven control loop. The Examiner relies on Boyle to teach a second early decision output. Assuming *arguendo* that Boyle does teach such a second early decision output, Boyle does not process that output with a first early decision output to drive the loop, as recited in

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independent claims 1, 47, and 93, and hence in all of their dependencies. Rather, Boyle uses the cited early decision outputs solely to reduce error, and says nothing about latency. Indeed, the motivation in Boyle for using two outputs as in Boyle Fig. 1 was to avoid gross equaliser misadjustment on dynamic channels. (Boyle, 178) In contrast, the prior art in the Background section of the present application already deals with the latency/accuracy tradeoff. The alternative to using a single early decision output would have been to use the loop output itself. That would have reduced error, but greatly prolonged latency. That was the problem that the prior art in the Background section already solved. Boyle contributes nothing to solving that problem. During the interview, the Examiner said that Boyle teaches that using a second early decision output can reduce error. Consequently, since it would be desirable to reduce error in a decision driven control loop, it would have been obvious to use a second early decision output in such a loop, as the Examiner contends is broadly claimed in claims such as claim 1. The undersigned understood the Examiner to be saying that a general alleged teaching of error reduction, such as in Boyle, would have made it obvious to apply that teaching in any context involving an early decision output, such as in Applicants' admitted prior art. During the interview, though the undersigned asked how the ordinarily skilled artisan would have been led to apply Boyle's alleged teachings to modify Applicants' admitted prior art, the Examiner gave no more specific response than to refer once again to error reduction. Pursuant to the foregoing discussion, Applicants submit that the claims of the present application are patentable".

In response to applicant's argument that "Boyle uses the cited early decision outputs solely to reduce error, and says nothing about latency", the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "latency") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's arguments against the references individually ("Boyle does not process that output with a first early decision output to drive the loop"), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986) (emphasis added).

For these reasons and the reason stated on the previous Office action, the rejection of claims 1, 47 and 93 are maintained.

Regarding claims 5, 28, 52, 74, 97, and 120:

Applicant's arguments filed on 09/11/2007 have been fully considered but they are not persuasive.

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The Applicant contends, "With respect to claims 5, 28, 52, 74, 97, and 120, neither the Background section of the present application nor Boyle indicates that, as between the first and second early decision outputs, the first early decision output will be used when there is no difference in the early decision signals. Boyle says that the symbol with the lowest metric will be used, but does not indicate whether that will be the first output or the second output. Therefore, Applicants submit that these claims are patentable for this additional reason as well".

The Examiner disagrees and asserts, that, if there is no difference in the early decision signals, in the system disclosed by Boyle, both will have the same metric so either one can be used, so the first one can be used.

There is not inventive step in that "because both are the same, use the first one", if both are the same, the first one and the second one will provide the same result, and Boyle in this case will use either one, so if we are using the first one we keep the first one, because it is not benefic in switching to the second one.

For these reasons and the reason stated on the previous Office action, the rejection of claims 5, 28, 52, 74, 97, and 120 are maintained.

Regarding claims 6, 29, 53, 75, 98, and 121:

Applicant's arguments filed on 09/11/2007 have been fully considered but they are not persuasive.

The Applicant contends, "With respect to claims 6, 29, 53, 75, 98, and 121, neither the Background section of the present application nor Boyle indicates that, as between the first and second early decision outputs, the second early decision output

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will be used when there is a difference in the early decision signals. Boyle says that the symbol with the lowest metric will be used, but does not indicate whether that will be the first output or the second output. Therefore, Applicants submit that these claims are patentable for this additional reason as well".

The Examiner disagrees and asserts, that, if there is a difference in the early decision signals, and the second has a metric in the system disclosed by Boyle, the second will be used, because the metric is lower.

There is not inventive step in that "if we are in the first one and the second one is better, then change to the second one", if we are using the first and the second provides a better result, the system will switch to the second one.

For these reasons and the reason stated on the previous Office action, the rejection of claims 6, 29, 53, 75, 98, and 121 are maintained.

Regarding claims 22, 45, 68, 91, 114, and 137:

Applicant's arguments filed on 09/11/2007 have been fully considered but they are not persuasive.

The Applicant contends, "With respect to claims 22, 45, 68, 91, 114, and 137, contrary to the Examiner's assertion, Boyle does not disclose or suggest that a subtraction occurs anywhere in the system, nor are the early decision signals combined in the manner recited in these claims. The early decision signals in Boyle are compared only to determine which signal has the smallest Euclidean metric. Therefore, Applicants submit that these claims are patentable for this additional reason as well".



The Examiner disagrees and asserts, that, as indicated in the previous Office action, Boyle also discloses subtracting between the first and second early decision outputs, where the result of the subtraction produces the processing output (Boyle figure 1 page 179 first paragraph).

Specifically Boyle indicates that "The decision device compares the metrics of the symbols from each of the two Viterbi detectors. As Euclidean distance is used to obtain the incremental metrics, the symbol with the lowest metric is chosen as the receiver output for that symbol interval". Comparing the two metrics using Euclidian distance is equivalent to produce a difference or subtraction to see which one is lower.

For these reasons and the reason stated en the previous Office action, the rejection of claims 22, 45, 68, 91, 114, and 137 are maintained.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made..

Claims 1-6, 22-29, 45-52, 68-75, 91-98, 114-121, 137-140 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Boyle ("A catastrophic error mode in adaptive predictive DIR equalisation of dynamic channels" 2001 IEEE Workshop on Signal Processing Systems, 26-28 Sept. 2001 Page(s): 177 – 184).

Regarding claims 1, 47, 93 and 116 AAPA discloses detecting data to produce early decision outputs; and processing said early decision outputs to produce a processing output that drives the decision-driven control loop (DDCL) (figure 1 paragraphs [0021]-[0031]). AAPA doesn't disclose first and second early decisions. Boyle discloses first and second early decisions (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 2, 48 and 94 AAPA and Boyle disclose claims 1, 47 and 93. Boyle also discloses that the first and second early decision outputs based on memory paths of differing lengths (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 3, 49 and 95 AAPA and Boyle disclose claims 2, 48 and 94. Boyle also discloses that the memory paths of differing lengths are equal to or less than the length of a full memory path (Boyle figure 1 page 179 first paragraph). AAPA and

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Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 4, 50 and 96 AAPA and Boyle disclose claims 1, 47 and 93. Boyle also discloses comparing the first and second early decision outputs to produce the processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 5, 51 and 97 AAPA and Boyle disclose claims 4, 50 and 96. Boyle also discloses that when the comparison between said first and second early decision outputs indicates no difference, then the first early decision output is used to produce said processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 6, 52 and 98 AAPA and Boyle disclose claims 4, 51 and 96. Boyle also discloses that when the comparison between the first and second early decision outputs indicates a difference, then the second early decision output is used to produce the processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of early decisions in endeavor of digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 22, 68 and 114 AAPA and Boyle disclose claims 1, 47 and 93. Boyle also discloses subtracting between the first and second early decision outputs, where the result of the subtraction produces the processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 23, 69 and 115 AAPA and Boyle disclose claims 1, 47 and 93. AAPA also discloses receiving a loop gain value to produce a gain value output as the processing output (figure 1 paragraphs [0021]-[0031])

Regarding claims 24 and 70 AAPA and Boyle disclose claims 1 and 47. AAPA also discloses and at least one of a variable gain amplifier and an analog-to-digital conversion receiving the processing output (figure 1 paragraphs [0021]-[0031])

Regarding claims 25, 71 and 117 AAPA and Boyle disclose claims 24, 70 and 116. Boyle also discloses that the first and second early decision outputs based on memory paths of differing lengths (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 26, 72 and 118 AAPA and Boyle disclose claims 25, 71 and 117. Boyle also discloses that the memory paths of differing lengths are equal to or less than the length of a full memory path (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 27, 73 and 119 AAPA and Boyle disclose claims 25, 70 and 117. Boyle also discloses comparing the first and second early decision outputs to produce the processing output (Boyle figure 1 page 179 first paragraph). AAPA and

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Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 28, 74 and 120 AAPA and Boyle disclose claims 27, 73 and 119. Boyle also discloses that when the comparison between said first and second early decision outputs indicates no difference, then the first early decision output is used to produce said processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 29, 75 and 121 AAPA and Boyle disclose claims 27, 74 and 120. Boyle also discloses that when the comparison between the first and second early decision outputs indicates a difference, then the second early decision output is used to produce the processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by

AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 45, 91 and 137 AAPA and Boyle disclose claims 24, 70 and 116. Boyle also discloses subtracting between the first and second early decision outputs, where the result of the subtraction produces the processing output (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claims 46, 92 and 138 AAPA and Boyle disclose claims 24, 70 and 116. AAPA also discloses receiving a loop gain value to produce a gain value output as the processing output (figure 1 paragraphs [0021]-[0031]).

Regarding claim 139 AAPA and Boyle disclose claim 1. Boyle also discloses that the first and second early decisions derive from separate data detectors (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

Regarding claim 140 AAPA and Boyle disclose claim 24. AAPA also discloses a decision-driven control loop (figure 1 paragraphs [0021]-[0031]). Boyle also discloses that the first and second early decisions derive from separate data detectors (Boyle figure 1 page 179 first paragraph). AAPA and Boyle are analogous art because they are from the same field of endeavor of early decisions in digital communications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the DDCL disclosed by AAPA the dual early decisions disclosed by Boyle. The suggestion/motivation for doing so would have been to reduce the error of the system (Boyle page 179 first paragraph).

#### ***Allowable Subject Matter***

Claims 7-21, 30-44, 53-67, 76-90, 99-113 and 122-136 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres  
09-13-2007

  
MOHAMMED GHAYOUR  
SUPERVISORY PATENT EXAMINER